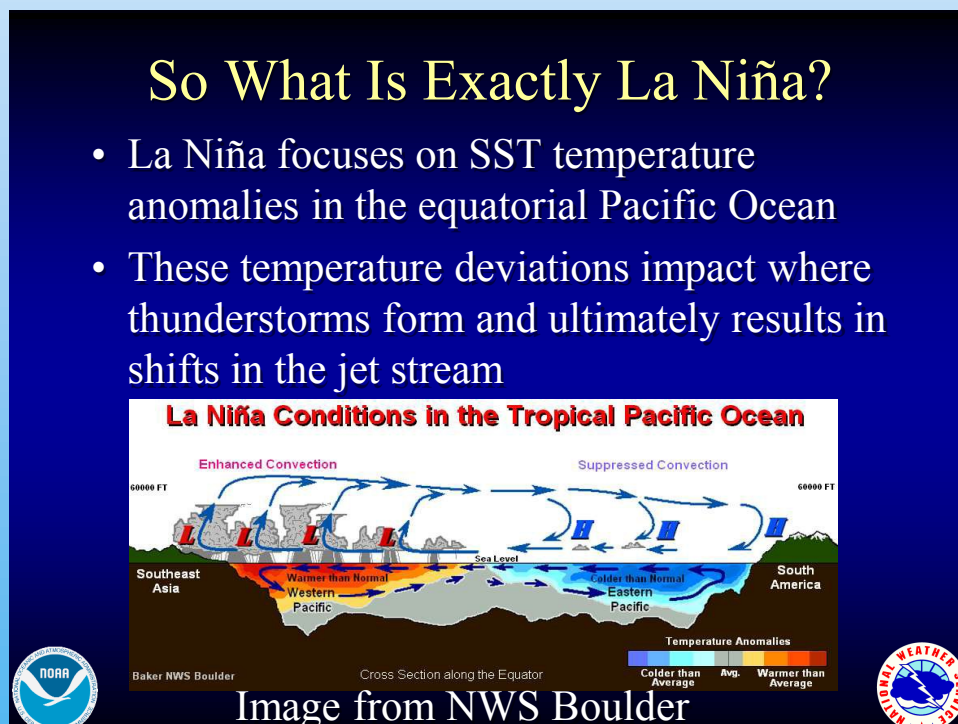


# 2011-2012 Winter Outlook

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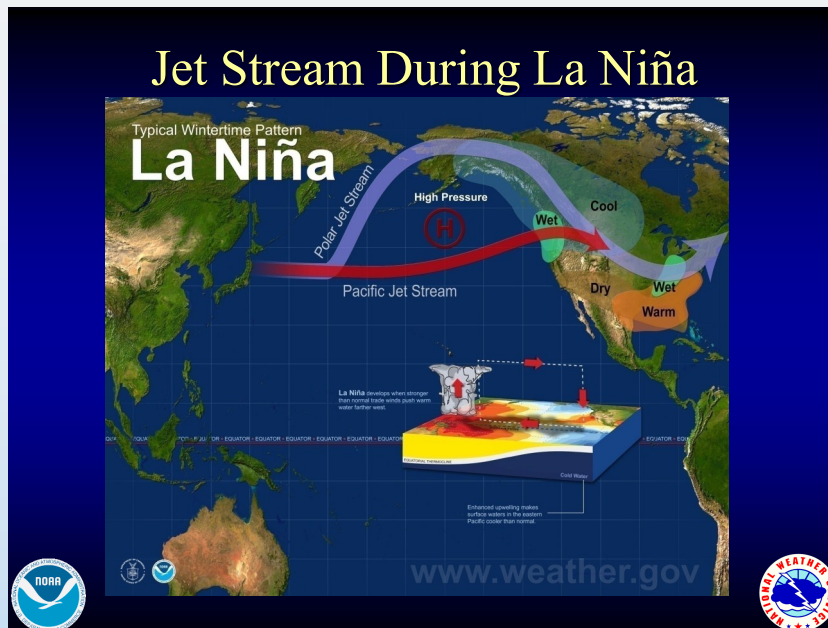
**What will the winter of 2011-2012 be like for southwest Kansas?**

Meteorologists can examine large scale climate signals to get a hint of what the upcoming winter season will be like. One major signal that has implications worldwide is ENSO (El Niño/Southern Oscillation). The ENSO cycle consists of El Niño, Neutral, and La Niña base states. Recently, the Climate Prediction Center (CPC) has issued a La Niña Advisory for the winter season. This means that La Niña conditions are expected to strengthen and continue throughout the next three months. So what exactly is La Niña? Anomalously cool sea surface temperatures in the central equatorial Pacific ocean mark the presence of La Niña. The image below summarizes La Niña and the related sea surface temperature anomalies.



Believe it or not, sea surface temperatures and thunderstorms over the equatorial Pacific does impact Kansas weather. Ultimately what happens in the tropics has feedback into mid latitude storm systems. The main impact from La Niña is a shift in the jet stream. The jet stream drives weather systems across the United States. The typical jet pattern during La Niña is shown in the following image.

# La Niña Explained...

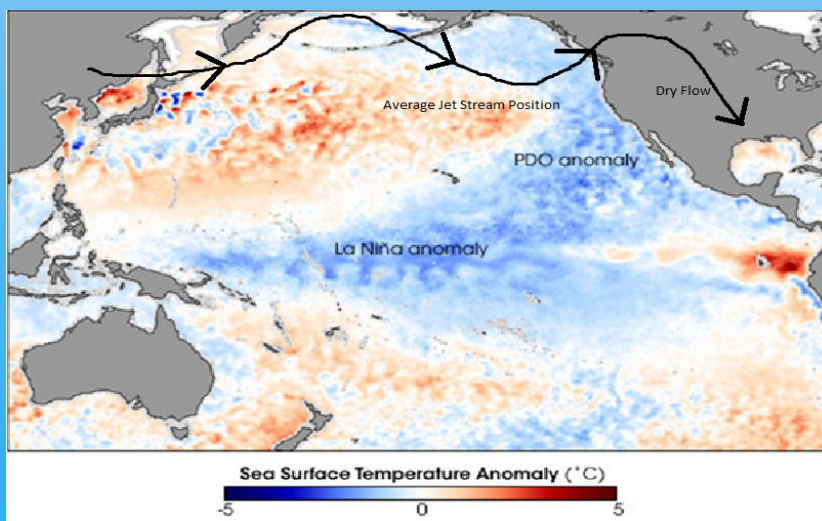


As you can see, Kansas lies on the warm side of the Polar jet. This configuration typically favors warmer and drier conditions throughout the winter season for SW Kansas.

## Wait...There is More Than Just La Niña

Climatologists also look at other indices to provide insight into what the upcoming seasonal weather pattern will be. The other two indices that are used is the Pacific Decadal Oscillation (PDO) index and the North Atlantic Oscillation (NAO) index.

The PDO is a long term event where the index changes very slowly over time (~10-20 years or so). We are expected to be in the cool phase of the PDO through winter, which favors upper level ridging over the Rockies. This flow pattern is not conducive in bringing moisture back to Kansas and weather systems typically bring lighter precipitation amounts to the region. The image below depicts the average jet stream position associated with the cool phase of the PDO.



# ENSO, NAO, PDO... Oh My!

The NAO is a short term event (typically ~2 weeks) and the index changes more rapidly from the positive phase to the negative phase. Typically, the negative phase allows for the invasion of Arctic air into the eastern two thirds of the United States. There is low skill in forecasting the NAO index beyond two weeks. Below is an image showing the two phases of the NAO. We do expect the index to become negative at times and Kansas could see very cold temperatures as a result.



Using the three aforementioned indices allows meteorologists to get a better picture of what the weather will be like this winter across SW Kansas. For example, with a cool phase PDO and negative phase NAO, we could see some light wintry precipitation events along with very cold temperatures across the Sunflower state.

Below is the official three month temperature and precipitation probability forecast from CPC. To summarize the two images, near to slightly above normal temperatures and near to slightly below normal precipitation is expected for SW Kansas from December through February. This includes a higher probability for below normal snowfall as well. Periodic Arctic outbreaks with a few moderate to heavy snow events are possible this winter, however, the overall climatic signal favors a drier and relatively warmer than normal winter season.

